

10-056-958

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,731,180 B1
DATED : May 4, 2004
INVENTOR(S) : Roger L. Clark, Joseph V. Adler and Jacob M. Li

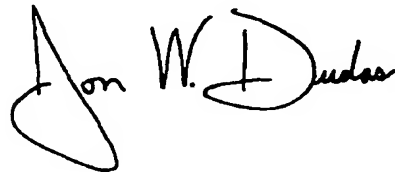
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It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Replace title page with the following title page
Delete informal drawings, Figs. 1-7, insert the following formal drawings Figs. 1-7

Signed and Sealed this

Ninth Day of November, 2004

A handwritten signature in black ink, reading "Jon W. Dudas". The signature is stylized, with a large, looped initial "J" and a cursive "Dudas".

JON W. DUDAS
Director of the United States Patent and Trademark Office

(12) **United States Patent**
Clark et al.

(10) Patent No.: **US 6,731,180 B1**
(45) Date of Patent: ***May 4, 2004**

(54) **EVACUATED HYBRID OVENIZED OSCILLATOR**

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(*) Notice: **Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.**

This patent is subject to a terminal disclaimer.

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Primary Examiner—Arnold M. Kinkead

(74) Attorney, Agent, or Firm—Maine & Asmus

ABSTRACT

The present invention is for a thermally controlled package for oscillators, particularly evacuated miniature surface acoustical wave oscillators (EMSO) devices. In a preferred embodiment the surface acoustical wave device is bonded directly to a heated substrate. The package is evacuated to improve temperature characteristics. A temperature heater, sensor, and control controller are utilized to maintain the internal package temperature above ambient. In one embodiment there is an additional substrate layer that house components that are not sensitive to temperature with interconnects electrically connecting the heated substrate and the additional substrates.

21 Claims, 7 Drawing Sheets

(21) Appl. No.: 10/056,958

(22) Filed: **Oct. 22, 2001**

Related U.S. Application Data

(60) Provisional application No. 60/242,103, filed on Oct. 20, 2000.

(51) Int. Cl.⁷ **H03B 5/32; H03L 7/00**

(52) U.S. Cl. **331/176; 331/68; 331/69;
331/158; 310/341; 310/343; 310/344**

(58) Field of Search **310/343, 346,
310/340, 341, 342, 344; 331/68, 69, 158,
176**

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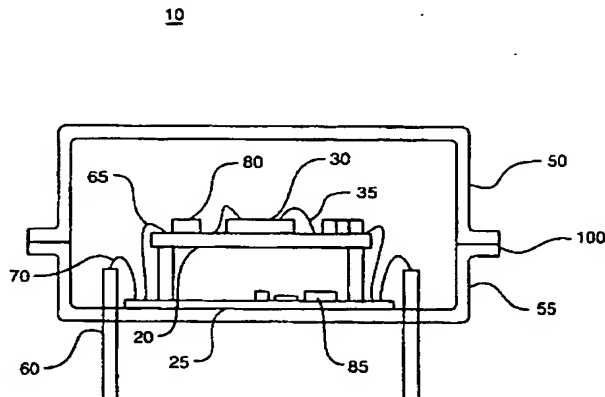


FIG. 1

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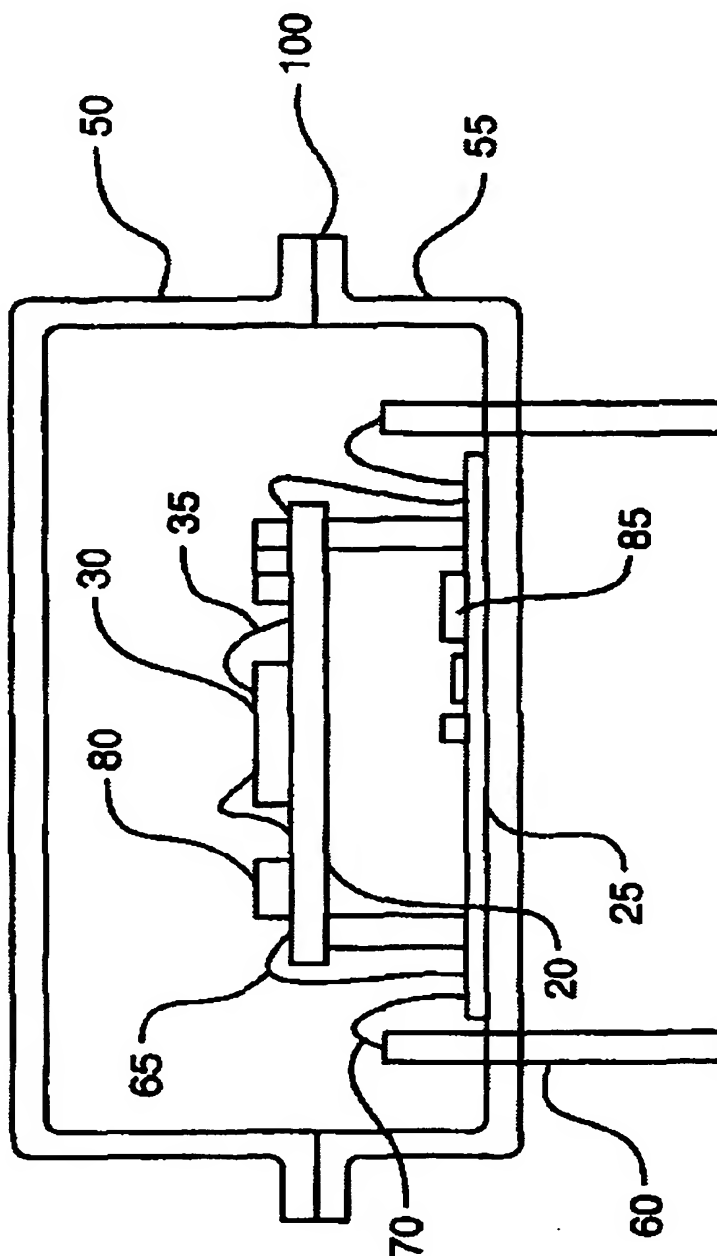


FIG. 1

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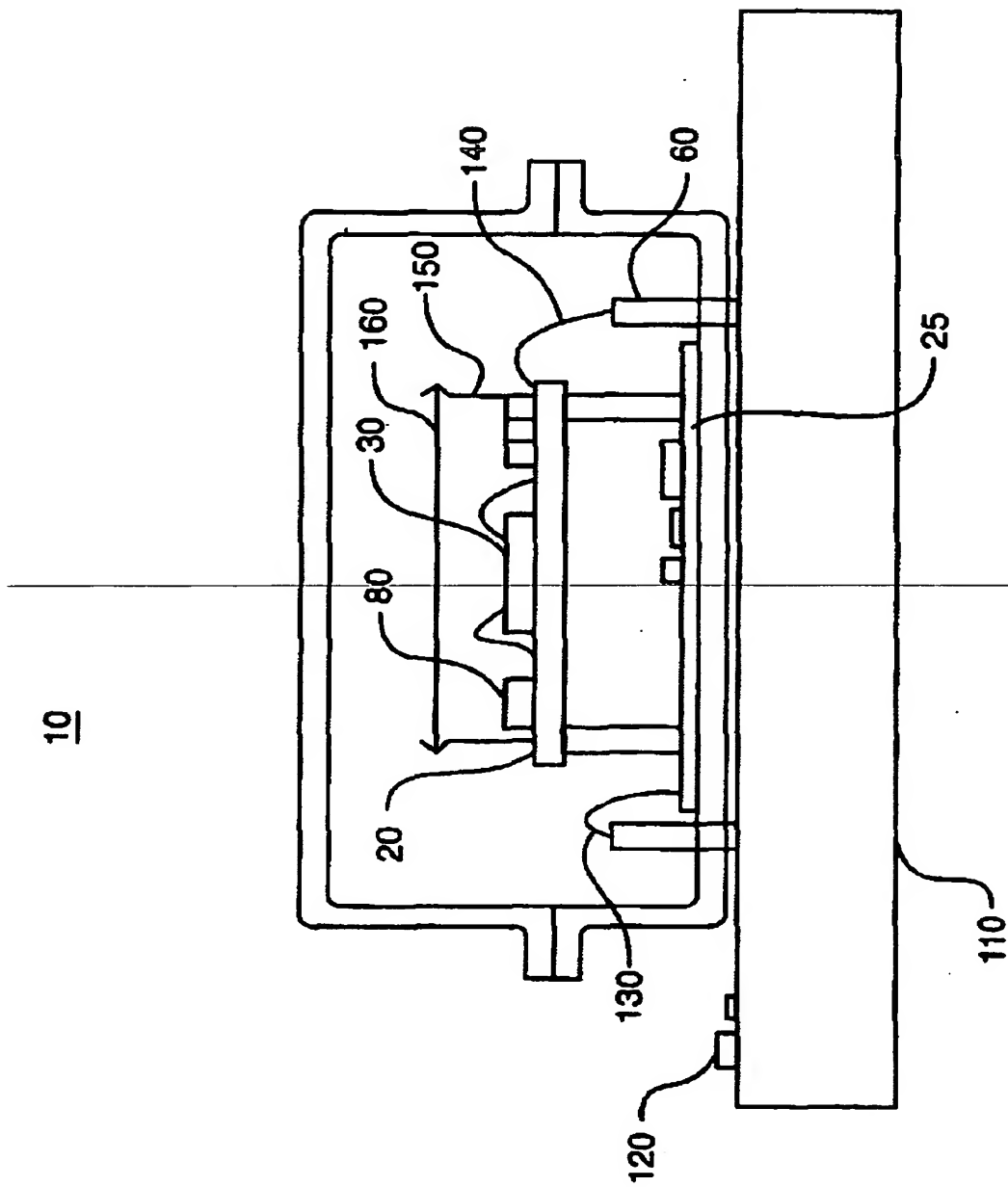


FIG. 2

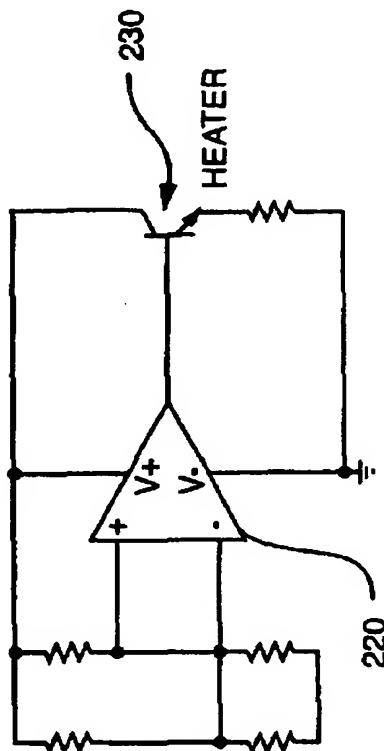
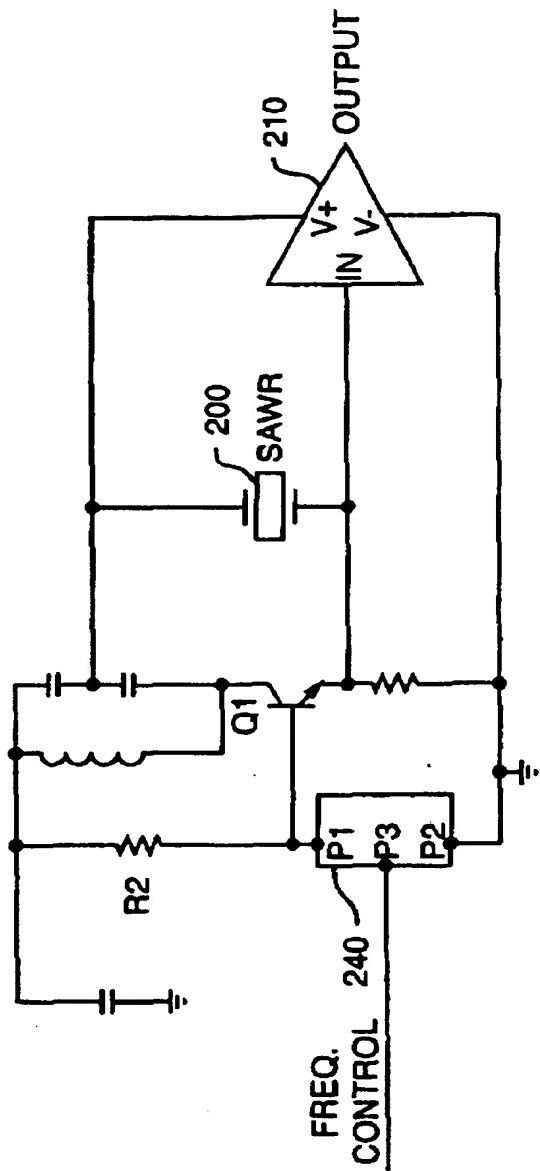


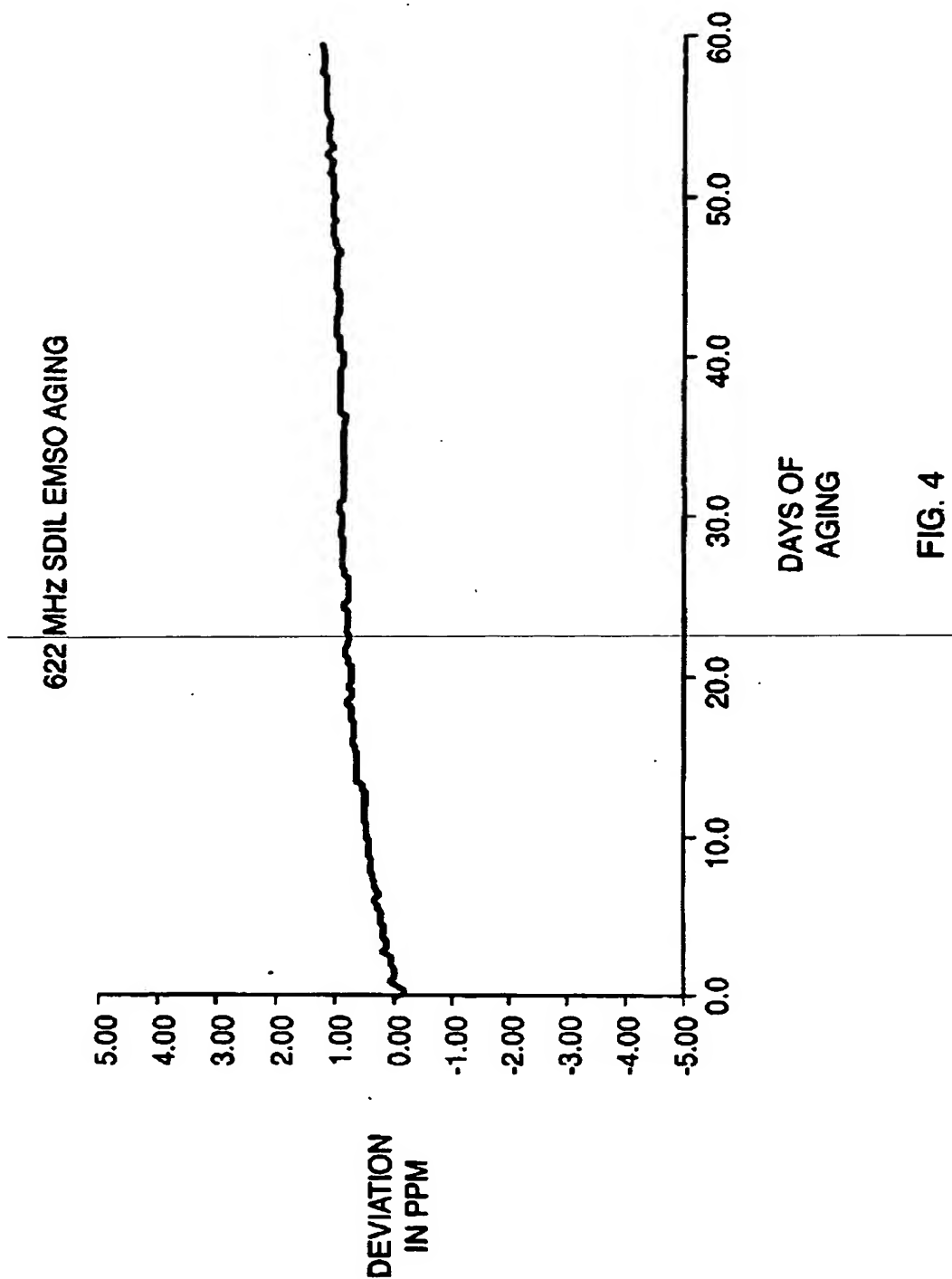
FIG. 3

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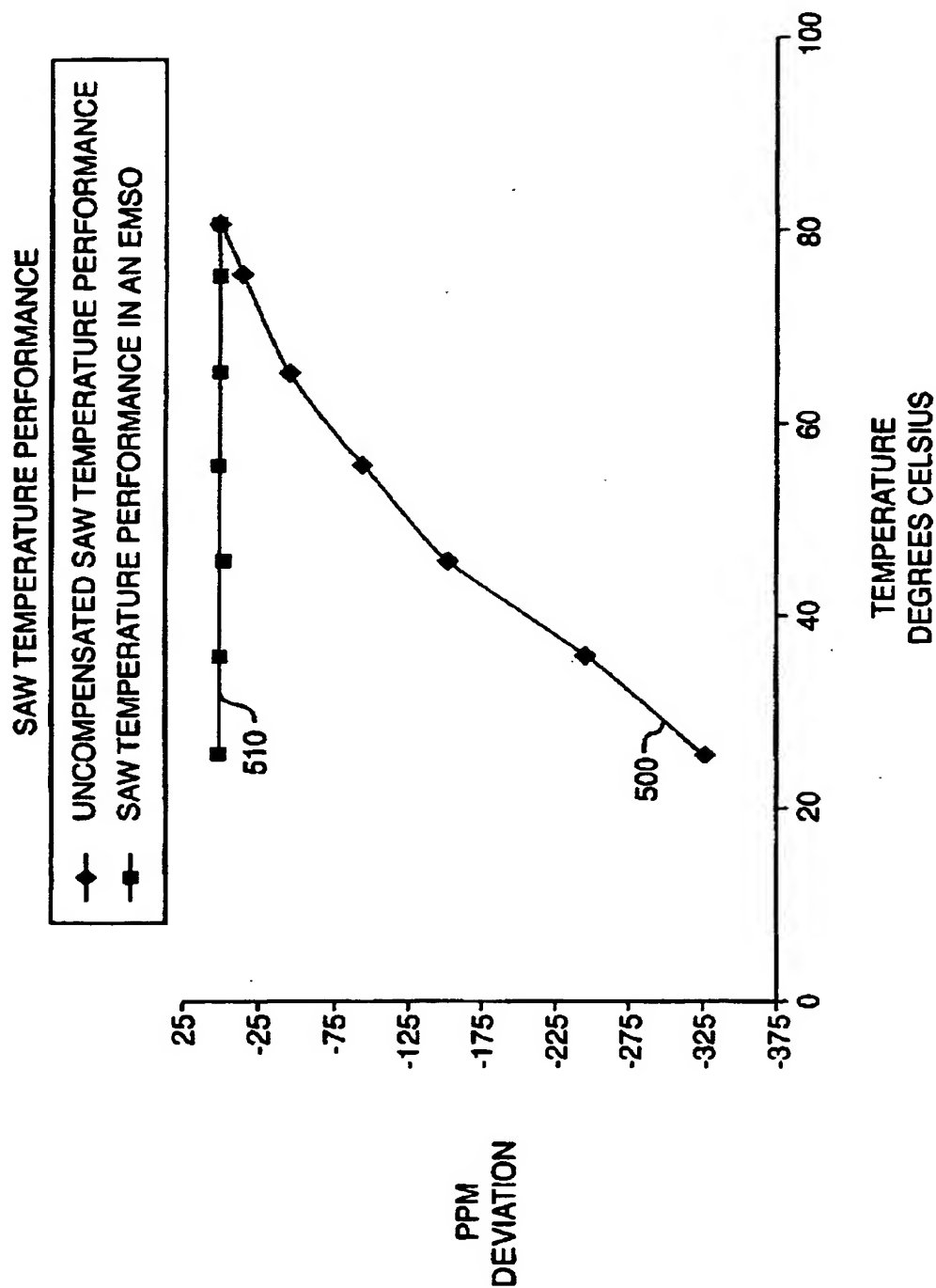


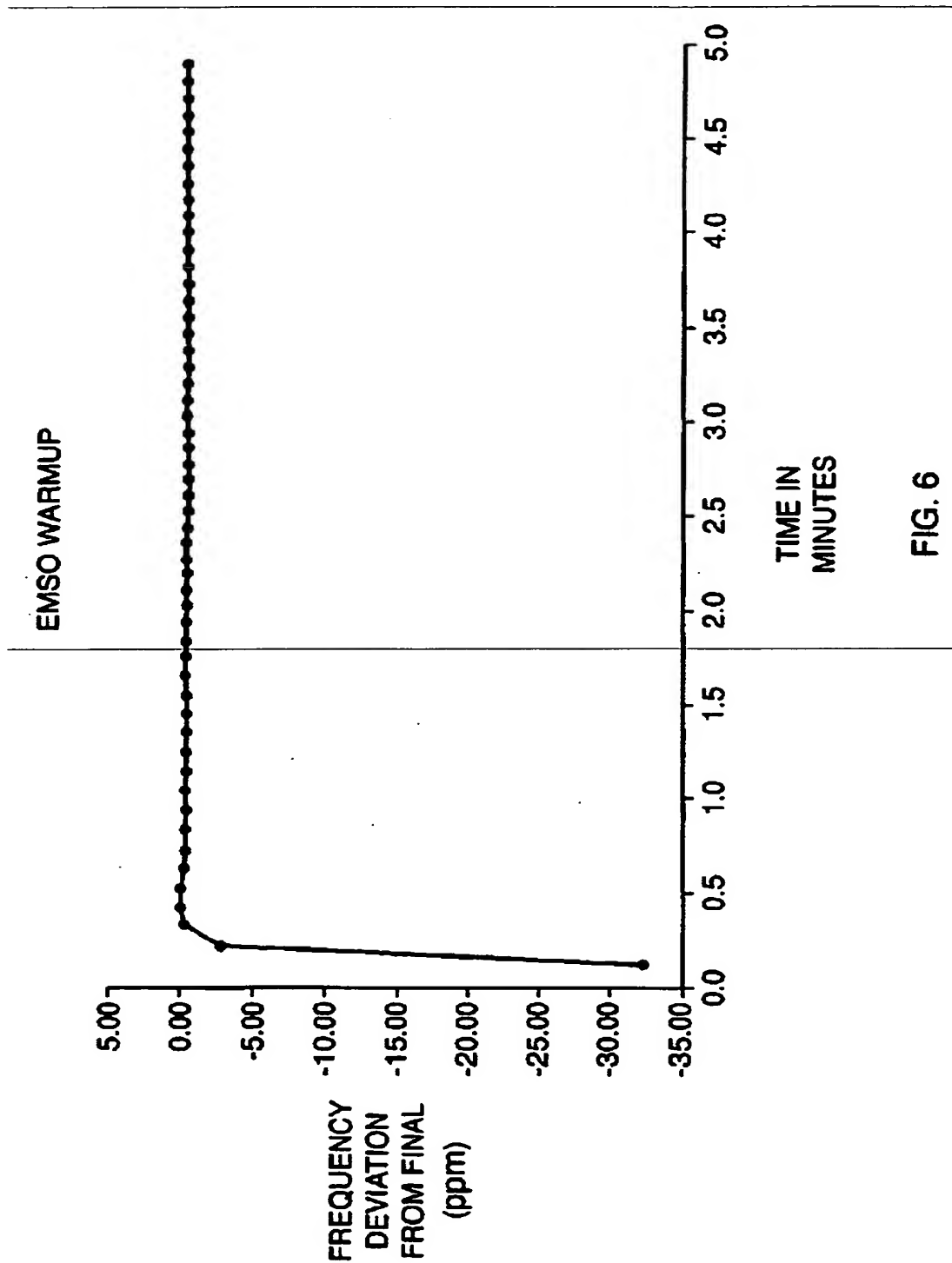
FIG. 5

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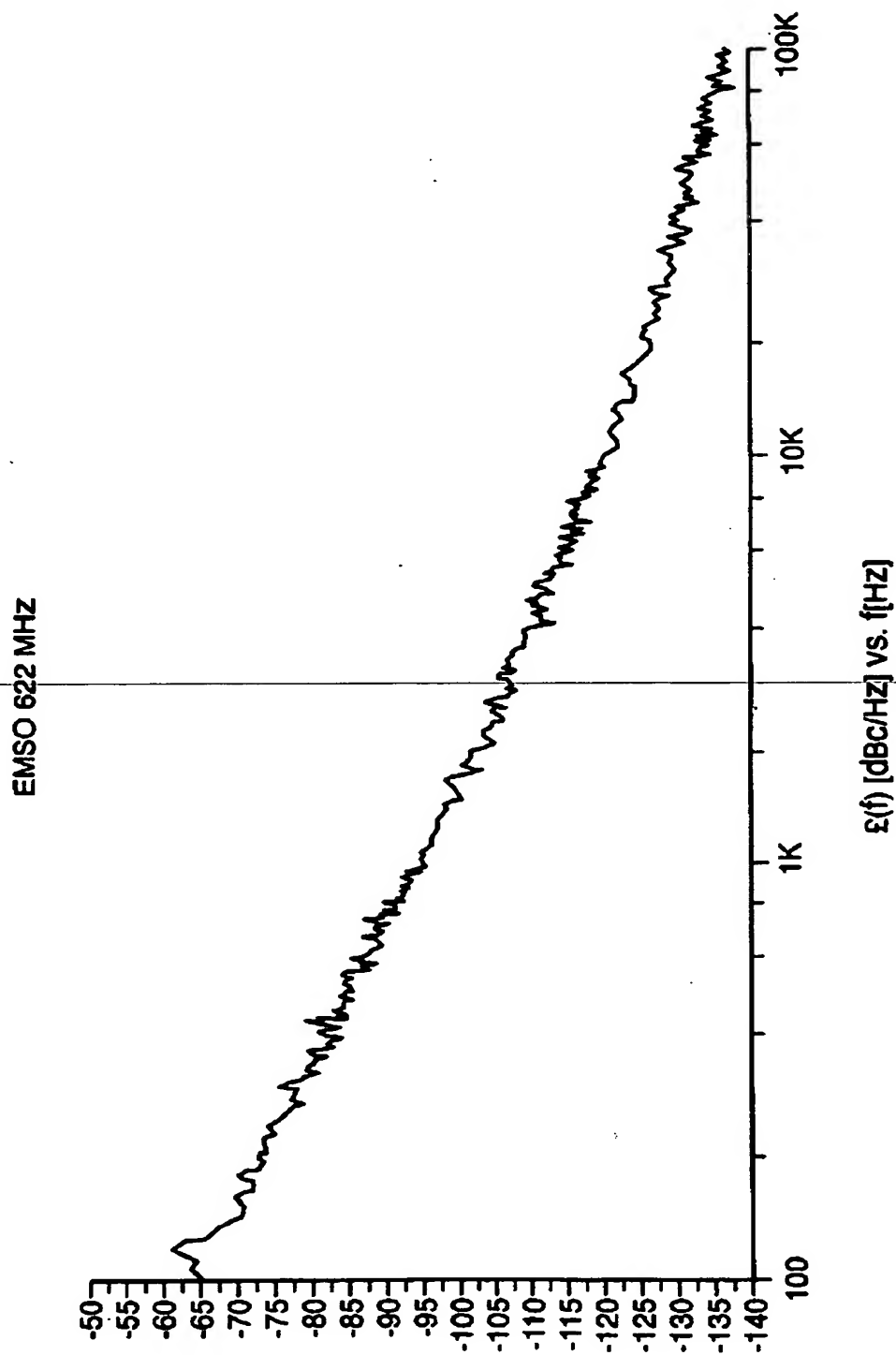


FIG. 7